# Plan Overview

*A Data Management Plan created using DMPonline*

**Title:** Encountering Flood Futures: Designing an Immersive, Approachable Narrative Experience

**Creator:**Jochem Buschman

**Principal Investigator:** Roy Bendor

**Data Manager:** Jochem Buschman

**Project Administrator:** Jochem Buschman

**Affiliation:** Delft University of Technology

**Template:** TU Delft Data Management Plan template (2025)

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**Project abstract:**

This research investigates how professionals in the water management domain engage with radically different futures for living with water. Using the Virtual Climate Lab — an interactive tool developed by Deltares consisting of a 3D-printed terrain model and a projection system, combined with a secondary TV screen — participants are presented with four speculative futures for Ridderkerk in 2100, each depicting a different approach to living with water.

The study examines how place-based, story-driven experiences can bridge the gap between intellectual understanding and emotional engagement with long-term climate change, using narrative design and physical interaction as the primary mechanisms.

Data is collected through group sessions involving 6 to 12 professionals, recruited via Deltares, in which participants experience the four futures, individually rank their preferred future, and discuss their responses. Sessions are audio recorded for qualitative analysis.

The research is conducted as a Master's graduation project within the Design for Interaction programme at TU Delft's Faculty of Industrial Design Engineering, in collaboration with Deltares as external partner.

**ID:** 197522

**Start date:** 02-12-2025

**End date:** 11-06-2026

**Last modified:** 11-05-2026

the creator(s) as the source of the language used, but using any of the plan's text does not imply that the creator(s) endorse, or have any relationship to, your project or proposal

# Encountering Flood Futures: Designing an Immersive, Approachable Narrative Experience

## 0. Administrative questions

### 1. Provide the name of the data management support staff consulted during the preparation of this plan and the date of consultation. Please also mention if you consulted any other support staff.

M.P. Netten, Data Steward at the Faculty of Industrial Design Engineering, has reviewed this DMP on 29 April 2026.

### 2. Is TU Delft the lead institution for this project?

- Yes, leading the collaboration – please provide details of the type of collaboration and the involved parties below

TU Delft is the lead institution, responsible for the research design, data collection, analysis, and publication of findings. The collaboration with Deltares is governed by the standard IDE two-party Graduation Contract, signed by the researcher on 3 December 2025 and by Deltares on 11 February 2026, with TU Delft as the institutional context. A copy of the signed agreement is included with the HREC application.

**Contractual arrangement.** Per Article 9 of the Graduation Contract, intellectual property rights on all student results relating to the graduation project transfer to Deltares, with the exception of copyright on the graduation report, which remains with the researcher. TU Delft retains the right to use the results for its own educational, research, promotional, and publicity activities. Per Article 15.2, if Deltares believes its interests may reasonably be harmed by publication of the report, Deltares may request a one- or two-year embargo from IDE's Educational Director at the green light meeting, subject to payment of the valid embargo fee.

**What Deltares provides.** Deltares is a collaborating partner. They provide the Virtual Climate Lab (VCL) tool used in the research sessions, located at their Delft premises, and simulation data used as background reference material for the design of the experience. Deltares also facilitates participant recruitment through their professional networks.

**Foreground and background information.** Per Article 13 of the Graduation Contract, a distinction is maintained between foreground information (the research conducted and results generated by the researcher, which form the Master's thesis and are not to be omitted from the report or placed in a confidential appendix) and background information (materials supplied by Deltares to enable the project, such as the VCL hardware and simulation data, which are kept confidential for a period of five years and, where needed, placed in a Confidential Appendix to the graduation report).

**Roles and responsibilities for data.** The researcher is responsible for all data capture, storage, pseudonymisation, transcription, and deletion. TU Delft supervisors (Roy Bendor and Ianus Keller) have access to research data via TU Delft OneDrive. Deltares does not have access to or responsibility for any research data collected during the project (audio recordings, transcripts, session notes, signed consent forms).

## I. Data/code description and collection or re-use

### 3. Provide a general description of the types of data/code you will be working with, including any re-used data/code.

| **Type of data/code** | **File format(s)** | **How will data/code be collected/generated?** *For re-used data/code: what are the sources and terms of use?* | **Purpose of processing** | **Storage location** | **Who will have access to the data/code?** |
|---|---|---|---|---|---|
| Audio recordings of group sessions | .m4a or .mp4 (audio track) | Recorded during in-person sessions using MS Teams on the researcher's TU Delft laptop, logged in via two-factor authentication | Qualitative analysis of participant responses and discussion | TU Delft OneDrive (researcher's TU Delft account) | Researcher and TU Delft supervisors (Roy Bendor, Ianus Keller) |
| Still photograph of card placement | .jpg or .png | Taken with researcher's phone immediately after the card placement exercise, framed so that no participants are visible | Record of card placement for qualitative analysis | TU Delft OneDrive | Researcher and TU Delft supervisors |
| Anonymous session notes and observations | .docx or .pdf | Written by researcher during or after sessions. Notes do not contain participants' names or other identifying references | Supplementary qualitative analysis | TU Delft OneDrive | Researcher and TU Delft supervisors |
| Transcripts of audio recordings (pseudonymised) | .docx or .txt | Generated from audio recordings using MS365 Copilot, with manual review by the researcher. Names are replaced with pseudonyms and identifying references are removed | Qualitative analysis | TU Delft OneDrive | Researcher and TU Delft supervisors |
| Personally Identifiable Information (PII) of participants: name, email | .xlsx or .docx | Collected by the researcher for scheduling, sending participant information in advance, and inviting participants to review their session transcript | Administrative — participant communication | TU Delft OneDrive, in a folder separate from research data | Researcher only |
| Personally Identifiable Information (PII): name and signature on consent forms | PDF (scanned consent forms) | Signed informed consent forms collected at the start of each session and scanned immediately afterwards. Physical originals destroyed after scanning | Administrative — documenting informed consent | TU Delft OneDrive, in a folder separate from research data | Researcher and TU Delft supervisors |

| | | | | | |
|---|---|---|---|---|---|
| Prototype materials of the Virtual Climate Lab experience | .docx, .mp3, .wav, .png, .jpg, .xlsx, physical components | Created by the researcher as part of designing the immersive experience. Includes the four future scripts, AI-generated aerial and street-level imagery, narrated audio for Aisha and the narrator, the scene table and storyboard, the physical modifications to the VCL (plate, support planks, light frame), and the printed ranking cards | Components of the prototype experience used to answer the research question | TU Delft OneDrive (digital files); physical components stored at Deltares premises | Researcher and TU Delft supervisors |
| Simulation data from Deltares | varies (provided by Deltares) | Received from Deltares as background reference material to inform the design of the experience | Reference material for designing the four future scenarios | Accessed at Deltares premises; not copied to the researcher's devices | Researcher only, per Deltares' permissions |

## II. Storage and backup during the research process

### 4. How much data/code storage will you require during the project lifetime?

- < 250 GB

### 5. Where will the data/code be stored and backed-up during the project lifetime? (Select all that apply.)

- TU Delft OneDrive

Research data is stored on the researcher's TU Delft OneDrive, accessed via two-factor authentication. OneDrive provides automatic backup, encryption at rest, and TU Delft-managed access control. Audio recordings are captured through MS Teams on the researcher's TU Delft laptop and saved directly to OneDrive. Transcripts, session notes, the still photograph of card placement, and scanned consent forms are saved to OneDrive in folders separated by data type, with PII (participant list, scanned consent forms) stored in folders separate from research data. Access is restricted to the researcher and TU Delft supervisors (Roy Bendor and Ianus Keller). The researcher's laptop is password-protected and uses disk encryption.

## III. Data/code documentation

### 6. What documentation will accompany data/code? (Select all that apply.)

- Data – README file or other documentation explaining how data are organised
- Data – Methodology of data collection

A README file accompanies the data on OneDrive, describing the folder structure, the contents of each folder, naming conventions for recordings (Session_YYYY-MM-DD), the pseudonymisation scheme (Participant 1, Participant 2, etc., assigned per session), and the deletion date of 31 July 2026. The methodology of data collection is documented in the Master's thesis and in the HREC application.

## IV. Legal and ethical requirements, code of conducts

### 7. Does your research involve human subjects or third-party datasets collected from human participants?

***If you are working with a human subject(s), you will need to obtain the HREC approval for your research project.***

- Yes – please provide details in the additional information box below

I intend to apply for ethical approval from the Human Research Ethics Committee. The HREC checklist has been completed and the application is pending submission and approval.

### 8. Will you work with personal data? (This is information about an identified or identifiable natural person, either for research or project administration purposes.)

- Yes

Personal data collected falls into two categories. Personally Identifiable Information (PII) consists of participants' names and signatures on signed informed consent forms, and participants' names and email addresses kept for scheduling and for inviting participants to review their session transcript. Personally Identifiable Research Data (PIRD) consists of audio recordings of group sessions and a still photograph of the card placement taken after the ranking exercise. No video is recorded, and the photograph is framed so that no participants are visible in the image.

Personal data is stored on the researcher's TU Delft OneDrive, accessed via two-factor authentication, accessible only to the researcher and TU Delft supervisors (Roy Bendor and Ianus Keller). Personal data is not shared with Deltares or any third party. All recordings, photographs, and original transcripts are destroyed by 31 July 2026. The principle of data minimisation is applied throughout: no demographic data (such as age or gender) is collected, and no personal information beyond what is essential for consent, communication, and analysis. Full details are provided in the accompanying HREC checklist.

**9. Will you work with any other types of confidential or classified data or code as listed below? (Select all that apply and provide additional details below.)**

***If you are not sure which option to select, ask your Faculty Data Steward for advice.***

- Yes, data which could lead to reputation/brand damage (for example, animal research, climate change)
- Yes, data related to competitive advantage (for example, patent, IP)
- Yes, confidential data received from commercial, or other external partners

This research is conducted in collaboration with Deltares, who developed the Virtual Climate Lab (VCL) used in the study. The categories ticked above apply to *background information* received from Deltares, as defined in Article 13 of the Graduation Contract. Below, each category is specified, along with how the associated data is handled, what Deltares has requested, and the risk mitigations in place.

**What is the confidential data from the external partner?** Deltares has provided two categories of background material:

1. *Access to the VCL hardware* (the projection table, projector, terrain model, and associated software), located on Deltares premises.
2. *Simulation data* describing water-related scenarios for the IJsselmonde / Ridderkerk area, used as reference material to inform the design of the four future scenarios.
3. *An exported simulation video* supplied by Deltares, used as a component of a flood scene within the prototype experience.

**What is the data related to competitive advantage (IP)?** The VCL is a Deltares-developed tool that combines hardware, software, and methodological IP. Deltares' simulation models and the underlying technical implementation of the VCL also fall under this category.

**What is the data that could lead to reputation or brand damage?** Findings regarding the effectiveness or limitations of the VCL as an engagement tool may touch on Deltares' reputation, since the VCL is publicly associated with them. Additionally, the speculative futures depict a real Dutch municipality (Ridderkerk) under climate stress; if misread as Deltares' predictions rather than as a researcher-designed speculative scenario, this could affect how Deltares' work is perceived.

**Will the VCL or its software be on the researcher's laptop?** The VCL hardware and Deltares' proprietary software remain at Deltares' premises. The researcher does not run Deltares software on personal devices. The exported simulation video supplied by Deltares for the flood scene is stored on the researcher's TU Delft OneDrive during the design phase and copied to the VCL playback machine at Deltares for sessions. The video is not shared with third parties, is not reproduced in the Master's thesis, and is deleted from the researcher's OneDrive by 31 July 2026.

**What has Deltares requested with regards to this data/software?** Per Article 13 of the Graduation Contract, all background information explicitly designated as confidential by Deltares is kept confidential by the researcher for a period of five years. Where reference to such material is essential in the thesis, it is placed in a Confidential Appendix that Deltares is entitled to review prior to publication. Per Article 15.2, Deltares may request a one- or two-year embargo at the green light meeting if it believes its interests may reasonably be harmed by publication.

**How are risks mitigated?**

- The VCL hardware and Deltares' proprietary software remain at Deltares' premises.
- Simulation data, including the exported video used in the flood scene, is treated as background reference material and is not reproduced in the thesis without Deltares' consent. The video is used only within the live experience and not redistributed.
- The thesis maintains a clear distinction between speculative futures designed by the researcher and the technical capabilities of the VCL, to prevent the futures being misread as Deltares' predictions.

- The Master's thesis is submitted to Deltares for review prior to publication, in line with Article 15.2 of the Graduation Contract.
- Findings are reported at the group level only; no quotes or observations are attributed to identifiable individuals or institutions.

**What safety measures are in place?**

- Confidentiality of background information for five years, per Article 13.
- Sensitive material, where necessary, placed in a Confidential Appendix accessible only to TU Delft supervisors and Deltares.
- All research data, including any references to Deltares background material in the researcher's own working notes, is stored on TU Delft OneDrive, accessed via two-factor authentication.
- Researcher's laptop is password-protected with disk encryption enabled.
- No background material is shared with third parties.

**10. How will ownership of the data and intellectual property rights to the data be managed?**

***For projects involving commercially-sensitive research or research involving third parties, seek advice of your Faculty Contract Manager when answering this question.***

The intellectual property rights are framed by the IDE Graduation Contract, a two-party agreement signed by the researcher and Deltares, with TU Delft as the institutional context. Per Article 9 of the Graduation Contract, intellectual property rights on all student results relating to the graduation project transfer to Deltares (the Company), with the exception of copyright on the graduation report, which remains with the researcher. TU Delft retains the right to use the results for its own educational, research, promotional, and publicity activities.

Personal data collected from participants (audio recordings, transcripts, signed consent forms, participant list) is not subject to the IP transfer in Article 9. This data is managed by the researcher under TU Delft's data governance and is not shared with Deltares, in line with the foreground/background distinction set out in Article 13 of the Graduation Contract.

**11. Which personal data or data from human participants do you work with? (Select all that apply.)**

- Job title and/or employer
- Telephone number, email addresses and/or other addresses as contact details for administrative purposes
- Free text fields (for instance, in questionnaires) in which participants could unintentionally share personal data
- Proof of consent (such as signed consent materials which contain name and signature)
- Audio recordings
- Names as contact details for administrative purposes

The still photograph taken of the card placement after the ranking exercise is framed so that no participants are visible in the image. The photograph therefore does not contain personal data of participants and is not categorised under "Photographs" above.

**12. Please list the categories of data subjects and their geographical location.**

Participants are professionals in the water management domain, including municipal staff and others working on spatial planning, water management, or climate adaptation. They are recruited through Deltares' professional networks and located in the Netherlands. Sessions take place at Deltares premises in Delft or at a municipality.

**13. Will you be receiving personal data from or transferring personal data to third parties (groups of individuals or organisations)?**

- No

**16. What are the legal grounds for personal data processing?**

- Informed consent

**17. Please describe the informed consent procedure you will follow below.**

Prior to each session, participants will be informed about the goals and procedures of the research project, the personal data being collected, and the purpose of processing. A digital copy of the Informed Consent Form (which includes participant information) will be shared with participants in advance. At the start of the session, the researcher will verbally summarise the key points and invite any questions. All participants will be asked to sign a physical informed consent form before the session begins, confirming their agreement to participate and to the processing of their personal data as described. Signed forms are scanned immediately afterwards and stored on TU Delft OneDrive; physical originals are destroyed using a cross-cut shredder owned by the researcher.

**18. Where will you store the physical/digital signed consent forms or other types of proof of consent (such as recording of verbal consent)?**

Signed consent forms are scanned immediately after each session and stored as PDFs on the researcher's TU Delft OneDrive, in a folder separate from all research data. Physical originals are destroyed using a cross-cut shredder owned by the researcher, immediately after scanning. The scanned forms are accessible only to the researcher and TU Delft supervisors (Roy Bendor and Ianus Keller) and are destroyed by 31 July 2026.

**19. Does the processing of the personal data result in a high risk to the data subjects? (Select all that apply.)**

***If the processing of the personal data results in a high risk to the data subjects, it is***

***required to perform a Data Protection Impact Assessment (DPIA). In order to determine if there is a high risk for the data subjects, please check if any of the options below that are applicable to the processing of the personal data in your research project.***

***If any category applies, please provide additional information in the box below. Likewise, if you collect other type of potentially sensitive data, or if you have any additional comments, include these in the box below.***

***If one or more options listed below apply, your project might need a DPIA. Please get in touch with the Privacy team (privacy-tud@tudelft.nl) to get advice as to whether DPIA is necessary.***

- None of the above apply

**23. What will happen with the personal data used in the research after the end of the research project?**

- Other – please explain below

All personal data is securely destroyed by 31 July 2026. This includes audio recordings, the still photograph of card placement, original (non-pseudonymised) transcripts, scanned consent forms, and the participant list (names and email addresses). Digital files are deleted from TU Delft OneDrive, with the OneDrive recycle bin emptied to ensure the files cannot be recovered. Physical signed consent forms are destroyed using a cross-cut shredder owned by the researcher, immediately after they have been scanned and stored as PDFs on OneDrive.

Only pseudonymised transcripts and anonymised, aggregated findings are retained for the thesis itself. The researcher recognises that anonymisation in small, specialised professional groups is not straightforward: an individual's expertise area, employer, or role can identify them even when their name is removed. A layered approach is therefore applied. During transcription, names are replaced with pseudonyms (Participant 1, Participant 2, etc.) and directly identifying references (employer names, project names, named colleagues) are removed or generalised. Participants are offered the opportunity to review their session transcript and request the removal of any content they consider sensitive. Findings are reported at the group level only, with no quotes or observations attributed to identifiable individuals or institutions. Where a particular quote risks identification even after redaction, the judgement call to include, generalise further, or omit it is made in consultation with the TU Delft supervisors (Roy Bendor and Ianus Keller), who have experience with qualitative anonymisation in stakeholder research.

No personal data is shared with or transferred to any third party, including Deltares.

**24. For how long will personal research data (including pseudonymised data) be stored?**

- Other – please state the duration and explain the rationale below

All personal research data, including pseudonymised transcripts, is destroyed by 31 July 2026. This date is approximately eight weeks after the graduation defence (3 June 2026), allowing time for any post-defence revisions to the thesis to be completed before the data is destroyed. Because the project

is a Master's graduation project with no follow-up research planned, and because the small, specialised participant group carries an ongoing re-identification risk that does not diminish over time, retention beyond this point would create privacy risk without research benefit.

### 25. How will your study participants be asked for their consent for data sharing?

- Other – please explain below (see guidance for additional options)

The anonymised dataset itself is not shared publicly; only anonymous, aggregated findings within the thesis are published. Participants do not give consent for the use of anonymous data, since anonymous data falls outside the scope of personal data processing. Instead, participants are *informed* in the Informed Consent Form about what happens to their data once anonymised. Specifically, they are informed that:

- Pseudonymised transcripts of the session are used for qualitative analysis by the researcher;
- Anonymous, aggregated findings are published in the Master's thesis, which is deposited in the TU Delft Repository and publicly accessible;
- Anonymous data is not used for any purpose beyond this research project and is not shared with third parties, including Deltares;
- Once raw recordings, photographs, and original transcripts are destroyed by 31 July 2026, only the pseudonymised transcripts used for the thesis remain, and these are also destroyed at that date.

The legal basis for the processing of personal data (audio recordings, transcripts before pseudonymisation, consent forms, participant list) is informed consent, as stated in Q16.

## V. Data sharing and long term preservation

### 27. Apart from personal data mentioned in question 23, will any other data be publicly shared?

***Please provide a list of data/code you are going to share under 'Additional Information'.***

- Not all non-personal data/code can be publicly shared – please explain below which data/code cannot be publicly shared, and why

Apart from personal data, the data generated by this project consists of: (a) the Master's thesis itself, (b) the prototype materials of the VCL experience (the four future scripts, AI-generated aerial and street-level imagery, narrated audio for the experience (a fictional character and a narrator), the scene table and storyboard, and the printed ranking cards), and (c) anonymous, aggregated findings derived from the analysis of participant data.

Of these, only the Master's thesis is publicly shared. The thesis is deposited in the TU Delft Repository and contains the anonymous, aggregated findings as well as documentation of the prototype design. The prototype materials are not shared as standalone open data; they are documented within the thesis where relevant, and the underlying digital files are retained by the researcher for the duration of the project. Per Article 9 of the Graduation Contract, intellectual property rights on these student results vest in Deltares (with the exception of copyright on the thesis itself), which further constrains independent public sharing of the prototype materials.

**29. How will you share research data/code, including those mentioned in question 23?**
***Select all that apply and provide additional details below.***

- I am a Bachelor’s/Master’s student at TU Delft and I will share the data/code in the body and/or appendices of my thesis/report in the TU Delft Repository

**30. How much of your data/code will be shared in a research data repository?**

- Not applicable - No data/code will be shared in a repository

**31. When will the data/code be shared?**

- As soon as corresponding results (papers, theses, reports) are published

**32. Under what licence(s) will the data/code be released?**

- Other – please explain below

The Master's thesis will be placed under standard TU Delft copyright upon deposit in the TU Delft Repository. Copyright on the thesis remains with the researcher, in accordance with the graduation agreement between TU Delft and Deltares.

## VI. Data management responsibilities and resources

**33. If you leave TU Delft (or are unavailable), who is going to be responsible for the data/code resulting from this project?**

My supervisor Roy Bendor, Associate Professor and program director DfI, Department of Human-Centered Design, Faculty of Industrial Design Engineering, with email address R.Bendor@tudelft.nl.

**34. What resources (for example financial and time) will be dedicated to data management and ensuring that data will be FAIR (Findable, Accessible, Interoperable, Re-usable)?**

No additional financial resources are required for data management. Data storage on TU Delft OneDrive incurs no cost, as it is provided as part of the standard TU Delft account. The Master's thesis

will be deposited in the TU Delft Repository free of charge. Data management is handled by the researcher within the normal time allocation of the graduation project.

**35. Which faculty do you belong to?**

- Faculty of Industrial Design Engineering (IDE)